F A C T S H E E T

Federal Emergency Management Agency

RADIOLOGICAL ACCIDENTS

Radiological accidents can occur wherever radioactive materials are used, stored, or transported. In addition to nuclear power plants, hospitals, universities, research laboratories, industries, major highways, railroads, or shipping yards could be the site of a radiological accident.

Know these facts about radiation and radioactive materials.

■ Radioactive materials are composed of atoms that are unstable. An unstable atom gives off its excess energy until it becomes stable. The energy emitted is radiation.

■ The process by which an atom changes from an unstable state to a more stable state by emitting radiation is called radioactive decay or radioactivity.

■ Radioactive materials are dangerous because of the harmful effect of certain types of radiation on the cells of the body. The longer a person is exposed to radiation, the greater the risk.

■ People receive some radiation exposure each day from the sun, radioactive elements in the soil and rocks, household appliances like television sets and microwave ovens, and medical and dental x-rays.

■ Radiation cannot be detected by sight, smell, or any other sense.

Contact your local emergency manager for information about how to respond to a radiological accident, and to learn emergency plans for schools, day care centers, nursing homes — anywhere family members might be.

Communities located on major transportation routes should develop and practice an emergency plan for handling transportation accidents involving radiological materials.

Learn your community's warning systems.

Obtain information about official evacuation routes from local officials.

Have disaster supplies on hand.

- Flashlight and extra batteries
- Portable, battery-operated radio and extra batteries
- First aid kit and manual
- Emergency food and water
- Nonelectric can opener
- Essential medicines
- Cash and credit cards
- Sturdy shoes

Three Ways to Minimize Radiation Exposure

There are three ways to minimize radiation exposure to your body:

Distance — The more distance between you and the source of the radiation, the less radiation you will receive. In a serious nuclear accident, local officials will likely call for an evacuation, thereby increasing the distance between you and the radiation.

Shielding — Like distance, the more heavy, dense materials between you and the source of the radiation, the better. This is why local officials could advise you to remain indoors if an radiological accident occurs. In some cases, the walls in your home would be sufficient shielding to protect you.

Time — Most radioactivity loses its strength fairly quickly. Limiting the time spent near the source of radiation reduces the amount of radiation you will receive. Following a radiological accident, local authorities will monitor any release of radiation and determine when the threat has passed.

Be prepared to evacuate or find shelter in your home.

Develop an emergency communication plan.

In case family members are separated from one another during a disaster (a real possibility during the day when adults are at work and children are at school), have a plan for getting back together.

Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance. Make sure everyone knows the name, address, and phone number of the contact person.

Listen to the radio or television for official information.

If advised to remain at home:

- Bring pets inside.
- Close and lock windows and doors.
- Turn off air conditioning, vents, fans and furnace.
- Close fireplace dampers.
- Go to the basement or other underground area.
- Stay inside until authorities say it is safe.
- If you must go out, cover mouth and nose. Be prepared to evacuate or find shelter in your home.

When coming in from outdoors:

- Shower and change clothing and shoes.
- Put items worn outdoors in a plastic bag and seal it.

If advised to evacuate:

- Listen to a radio or television for information on evacuation routes, temporary shelters, and procedures.
- Minimize contamination in house.
- Close and lock windows and doors.
- Turn off air conditioning, vents, fans, and furnace.
- Close fireplace dampers.
- Take disaster supplies.

Remember your neighbors who may require special assistance — infants, elderly people, and people with disabilities.

After the Event

When the immediate danger has passed, avoid using foods from your garden or milk from your cows or goats until these can be inspected by a local emergency official. Contamination could affect areas as far as 50 miles from the accident site.

EPI
EMERGENCY PUBLIC INFORMATION

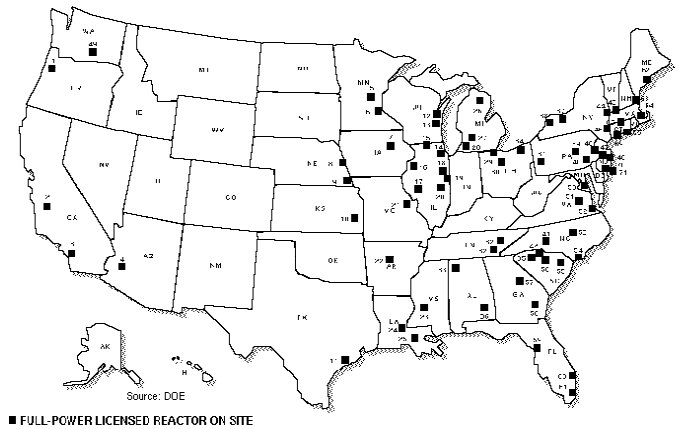
RADIOLOGICAL ACCIDENTS

EMERGENCY INFORMATION

1. Protection in a nuclear emergency comes from **distance** (the more distance from the radiation the better), **shielding** (protection using heavy materials that absorb radiation), and **time** (radiation loses its intensity rapidly).

2. Radioactive materials are dangerous because of the harmful effect of certain types of radiation on the cells of the body. A radiation accident could allow radiation to contaminate the environment. Radiation cannot be detected by sight, smell, or any other sense.

3. Nuclear power plant accidents will not cause the widespread destruction of a nuclear weapon nor will they produce radiation fallout. A power plant accident can cause an environmental radiation hazard by releasing radiation into the air.



Thirty-eight states, particularly those in the eastern half of the contiguous 48 states and the West Coast States have a full power, licensed reactor on site. Nearly three million Americans live within 10 miles of an operating nuclear power plant.

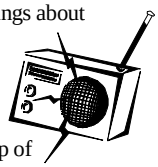
WHAT IS A RADIOLOGICAL ACCIDENT?

A radiological accident is an event that involves the release of potentially dangerous radioactive materials into the environment. This release is usually in the form of a cloud or "plume" and could affect the health and safety of anyone in its path. Radiological accidents can occur anywhere that radioactive materials are used, stored, or transported. Nuclear power plants, transport of radiological materials, and disposal of radioactive waste all pose risks. However, operations of facilities and the transport and disposal of radioactive waste are closely regulated by a variety of federal and local organizations, so the likelihood of an incident is remote.

HELP YOUR COMMUNITY GET READY

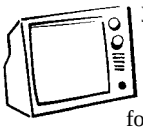
The media can raise awareness about radiological accidents by providing important information to the community. Here are some suggestions:

1. Inform your community of the locations of nuclear power plants, radioactive storage sites, radioactive waste dumps, and facilities that use radioactive materials in your area. Inform your community of public information meetings about safety precautions and emergency plans.

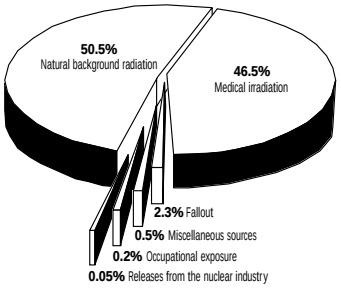


2. Periodically report on your community's public warning systems and the terms used to describe a nuclear emergency.

3. Publish a special section in your newspaper containing a map of your community that readers can use to plan several evacuation routes. Include guidelines for selecting the routes based on information from your local emergency management officials and provide a list of emergency supplies that should be pre-assembled for a quick getaway.



Sources of Radiation to U.S. Population



The nuclear energy industry contributes far less than 1 percent of the average person's to radiation.

Source: *National Academy of Sciences, 1980: National Council of Radiation Protection and Measurement, 1984*

DID YOU KNOW...

- Nuclear energy is second only to coal as an energy source and contributes over 16 percent of all the electricity generated in the United States.

- A **meltdown** occurs when the water that keeps the reactor core cooled is lost for an extended time, allowing the ceramic fuel pellets and metal fuel pins that help prevent the accidental release of radioactive material to overheat. To prevent this, nuclear power plants are designed with several independent cooling systems that operate automatically with a loss of coolant.

- About three million shipments of radioactive materials are made each year by highway, railroad, aircraft and ship. No deaths or serious injuries have ever been attributed to the radioactive nature of any materials involved in a transportation accident.

- People receive some radiation exposure each day from the sun, radioactive elements in the soil and rocks, household appliances like television sets and microwave ovens and medical and dental x-rays.

- The worst nuclear power plant accident in U.S. history occurred at the Three Mile Island nuclear power plant near Harrisburg, Pennsylvania in 1979. A minor mechanical malfunction compounded by human error damaged the nuclear reactor core and threatened to release radioactive materials into the environment. With assistance from government officials and nuclear scientists, a serious release of radioactive materials was avoided, although officials were able to detect radiation up to 20 miles from the site.

Terms for Describing Nuclear Emergencies

- *Notification* of unusual event means a problem has occurred *at the plant*, but there is no radiation leak. Federal, state and county officials will be notified by plant officials.

- *Alert* means there could be a radiation leak inside the plant, but it will not affect the community. Federal, state and county officials will be on standby in case they are needed.

- *Site area emergency* describes a more serious problem. Small amounts of radiation could leak from the plant. If necessary, state and county officials will act to ensure public safety.

- *General emergency* refers to a serious problem. Radiation could leak off the plant site. State and county officials will act to ensure public safety.

EPI
EMERGENCY PUBLIC INFORMATION